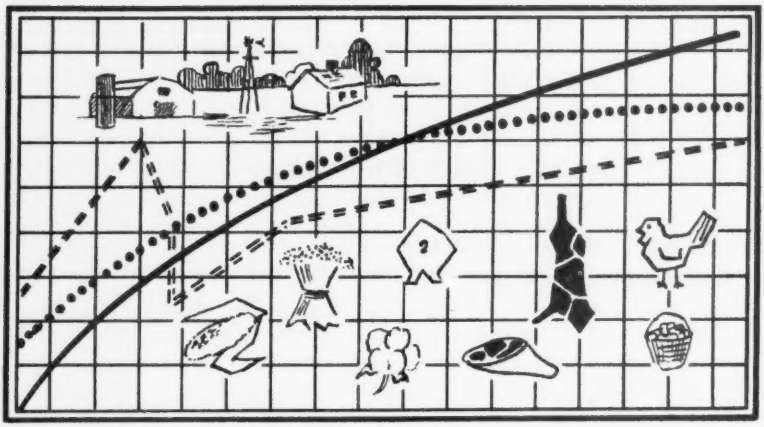
Oklahoma Current Farm Economics



SPECIAL REPORTS

The Demand for Dairy Farm Labor

Recent Trends in Oklahoma's Agriculture

Elements of Conservation Economics

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Oklahoma Current Farm Economics

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The Demand for Dairy Farm Labor

Clark Edwards

For every 20 farms in Oklahoma, eight keep dairy cattle of some description. However, only one of these eight farms is considered a dairy farm in the sense that dairying is a major enterprise providing more than half of the family income. The average size of herd for the one farmer in twenty, classified by the census as a dairy farmer, is from 20 to 40 cows. Several of these herds have more than 100 cows.

In a recent study of dairy farm organization in central and northeast Oklahoma four out of five farms observed were family sized farms.[1]

However, an analysis of the growth potential on these farms indicated most of them could profitably be expanded beyond the limits of the family supply of labor provided competent help could be hired at reasonable wage rates. It is therefore important to know the value of labor on Oklahoma dairy farms.

Several of the dairymen interviewed stated that they were not expanding their herds because the quality of help they needed was not available at the usual farm wage of $1.00 to $1.25 per hour, or $3,000 to $3,750 per year. They were firmly convinced that higher wages could not be justified. While even the best of labor cannot add much value to farm income during slack seasons, it was shown in one of the situations studied that the hired man added $11,100 to farm income for a year's work, or $7,350 more than the $3,750 wage allowed.

Data for evaluating operator and hired labor are presented in Table 1 which shows that the average value of all labor used in a 60-cow organization is $2.13 per hour. That is, after all expenses including 5 percent interest on the operator's equity are paid for, enough revenue will remain to pay the operator and his hired hands at the rate of $2.13 per hour. A herd expansion from 60 to 75 cows would provide

[1] Clark Edwards and H. W. Grubb, "Dairy Farm Organization in Central and Northeast Oklahoma," Oklahoma Agricultural Experiment Station, Bulletin B-573, February, 1961.

enough additional income to give everyone, including the operator, a raise of ten cents an hour for an average wage rate of $2.23.

Table 1.—The Value of Labor on Dairy Farms in Central and Northeastern Oklahoma, 1959.

Present Herd Size	Expanded Herd Size	Average Value, All Labor		Operator's Labor Income		Average Wage Rate Payable
		Representative Organization	Expanded Organization	Representative Organization	Expanded Organization	
20	27	$ .99	$1.26	$ .99	$1.26	$ --
25	25	1.45	1.45	1.45	1.45	--
32	40	1.66	1.68	1.70	1.84	1.63
46	60	2.13	2.15	2.46	2.79	1.71
60	75	2.13	2.23	2.84	3.40	1.71
84	108	2.17	2.28	3.51	4.45	1.69

An equal hourly return to all labor used on the farm could be expected in a partnership where both partners shared equally in the labor, management and risk. On the other hand, for a two man farm in which one man assumes all the responsibility of management and risk while the other assumes none, it is reasonable that one receive more per hour than the other.

When the hired man is paid the usual $1.25 per hour for his labor in the present organization of 60 cows, the operator's income is $2.84 an hour. In this example, the hired man receives $.88 an hour less than the average value of all labor, while the operator receives $.71 more. These differences are reasonable on the grounds that the operator supplies more than a 12 month supply of labor; he supplies the capital and management and he bears the business risks as well.

In the example of the 60-cow farm, nine months and 21 days of hired labor are used in addition to the operator's labor in the present farm organization. For the expanded herd of 75 cows, 14 months and 9 days of hired labor are needed in addition to the operator, or an additional four months and 18 days.

If additional help can be hired for $1.25, the expansion from 60 to 75 head increases the operator's labor income from $2.84 to $3.40. The higher rate of return to the operator's labor is, of course, to the benefit of the dairyman, and the best farm organization is one which maximizes the operator's income subject to the restrictions imposed on the analysis.

Suppose the right man is found to supply the additional labor, but he wants more than $1.25 an hour; and further suppose that when the present hired man finds out that the new one is getting higher wages he will expect a raise. The maximum wage rate that may be afforded in this situation for the entire 14 months and 9 days of hired labor is presented in the right hand column of the table. In this column we find that a wage rate up to $1.71 could be paid for all hired labor after the expansion without adversely affecting the operator's labor income.

The wage rate of $1.71 is a breakeven rate in the sense that if the operator pays more than $1.71 per hour for hired labor in the 75-cow herd, his net income will be less than if he paid $1.25 per hour for hired labor in the 60-cow herd. To pay exactly $1.71 would mean that he is no better off financially with 75 cows than he was with 60 even though he has made additional investments and assumed more risk. His hourly return is $2.84 in each imagined situation.

On the other hand, if the additional hired labor is paid the usual rate of $1.25 per hour, the expansion of 15 cows results in an hourly increase of $.56 for the farm operator for a total return of $3.40 per hour.

Results of this analysis show that the dairyman considering an expansion from 60 to 75 cows has every reason to be willing to pay at least the usual wage rate of $1.25 an hour, but, under the assumptions of this analysis could not afford to pay more than $1.71.

How much he will have to pay between the lower limit of $1.25 and the upper limit of $1.71 depends on individual circumstances. The more he has to pay for labor, the less he will have left for the increased managerial responsibility, risk bearing, and for repayment of borrowed capital for expansion and, therefore, the less attractive the expansion possibilities will appear.

In conclusion, most dairymen with 20 to 25 cows or less have little growth potential and hired labor is not likely to become a problem. For dairymen with 32 to 46 cows the growth potential is such that while these farms may be operated with family labor now, the use of competent hired labor at good wages should be considered when evaluating growth in the farm business over the next few years. Larger farms are already using some hired labor and managers of these farms must recognize that a good hired hand may be worth far more to the business than he costs.

Recent Trends in Oklahoma's Agriculture

W. B. Back

Major adjustments associated with the trend toward fewer and larger farms in Oklahoma, starting about 1935, continued in the latter half of the decade of the 1950's.[1] This article summarizes some of these adjustments on the basis of data in the 1954 and 1959 censuses of agriculture, *Agricultural Statistics* of 1960, and other sources.

Number and Sizes of Farms

According to census estimates, there were 94,675 farms in Oklahoma in 1959, with an average size of 378.2 acres, compared with 118,979 farms in 1954, with an average size of 299.5 acres. However, there was a change in the definition of a farm for the 1959 census, and this change resulted in a farm count 6,463 less than would have been the total had the 1954 definition of a farm been used for the 1959 census.[2] Thus, by the 1954 census definition of a farm, numbers of farms in Oklahoma decreased from 118,979 to 101,138 during the five-year period, or at about the same annual rate of decline as occurred during 1935-54.

Changes in numbers of farms were uneven over the state. Excluding Economic Areas A and B (Tulsa and Oklahoma counties), the decline in numbers in the period ranged from 9.9 percent in Economic Area 3, to 20 percent in Economic Area 6, based upon the 1954 census definition of a farm (Table 1). During this period, 1954-59, the drop in farm count (by 1954 definition of a farm) was 9.1 percent in Tulsa County and 25.6 percent in Oklahoma County. The change in definition of a farm made little difference in the reported numbers of farms in western Oklahoma (Economic Areas 1, 2, and 4). However, the

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[1] See "Developments in Oklahoma's Agriculture," Oklahoma Agricultural Experiment Station Bulletin B-500, 1957, for a narrative and graphic summary of trends and adjustments during 1930-1955.

[2] For the Censuses of Agriculture for 1950 and 1954, a farm was defined as a place containing three acres or more if the annual value of farm products, exluding home-garden products, amounted to $150 or more; for the 1959 Census of Agriculture, a farm was defined as a place of 10 acres or more if the sale of agricultural products amounted to $50 or more annually, or less than 10 acres if the sale of agricultural products amounted to $250 or more annually.

change in definition did make considerable difference in the count of farms in 1959 in the metropolitan counties of Tulsa and Oklahoma and in eastern Oklahoma. For these areas, the change in definition reduced the farm count up to about 12 percent.

Table 1.—Change in Numbers of Farms in Oklahoma by Economic Areas, 1954-1959

Economic Area*	Number of Farms			Change in number of farms, 1954-59, Percent	
		Definition of 1959 farms as in census of		Definition of 1959 farms as in census of	
	1954	1954	1959	1954	1959
1	11,051	9,581	9,463	—13.3	—14.4
2	15,525	13,654	13,393	—12.1	—13.7
3	10,208	9,200	8,462	— 9.9	—17.1
4	18,451	15,419	15,060	—16.4	—18.4
5	13,608	11,457	10,853	—15.8	—20.2
6	8,426	6,742	6,203	—20.0	—26.4
7a	6,550	5,633	5,157	—14.0	—21.3
7b	4,297	3,449	3,102	—19.7	—27.8
8a	10,195	8,547	7,626	—16.2	—25.2
8b	5,362	4,789	4,199	—10.9	—21.7
9	11,088	9,208	8,233	—17.0	—25.7
A	1,807	1,642	1,415	— 9.1	—21.7
B	2,411	1,793	1,509	—25.6	—37.4
State	118,979	101,138	94,675	—15.0	—20.4

*Counties by economic areas are as follows: 1. Beaver, Cimarron, Custer, Dewey, Ellis, Harper, Roger Mills, Texas, Woods, Woodward; 2. Alfalfa, Blaine, Canadian, Garfield, Grant, Kay, Kingfisher, Major, Noble; 3. Craig, Mayes, Nowata, Osage, Ottawa, Rogers, Washington; 4. Beckham, Caddo, Comanche, Cotton, Grady, Greer, Harmon, Jackson, Kiowa, Tillman, Washita; 5, Cleveland, Garvin, Lincoln, Logan, McClain, Pawnee, Payne, Pottawatomie; 6. Coal, Creek, Hughes, Okfuskee, Pontotoc, Seminole; 7a. Carter, Jefferson, Johnston, Love, Murray, Stephens; 7b. Bryan, Choctaw, Marshall; 8a. Haskell, McIntosh, Muskogee, Okmulgee, Sequoyah, Wagoner; 8b. Adair, Cherokee, Delaware; 9. Atoka, Latimer, LeFlore, McCurtain, Pittsburg, Pushmataha; A. Tulsa; B. Oklahoma.

Farm Mechanization

As reported in a previous study, rapid advances in farm mechanization were made on Oklahoma farms during the period 1930-54, particularly during 1945-54.[3] However, during 1954-59, smaller changes occurred in the number of major items of farm machinery on Oklahoma farms. The number of tractors increased from 106,444 to 108,765 during the period. The number of pickup balers increased by about 2,000, up from 9,378 in 1954. However, the number of combines declined from 27,717 to 27,045, and the number of milking machines on Oklahoma farms decreased from 8,863 to 8,230 during the period. On

[3] "Developments in Oklahoma's Agriculture," *op. cit.*

a per farm basis, all of these items in farm mechanization increased significantly during 1954-1959. There were about 0.9 tractors per farm in 1954 but nearly 1.1 per farm in 1959; there was one pickup baler per 12 farms in 1954 but one per nine farms in 1959; there was one combine per 4.3 farms in 1954 compared with one per 3.7 farms in 1959; and there was a milking machine to about every 13 farms in 1954 compared to a machine to every 12 farms in 1959.[4] It can be concluded, therefore, that significant increases in farm machinery did occur on individual Oklahoma farms during the period 1954-59.

Irrigation and Fertilizer Use

The number of acres irrigated nearly doubled in the period 1954-59, from 108,251 to 197,237 acres. The latter acreage is about 1½ percent of the cropland in Oklahoma. Information on irrigation compiled by the Oklahoma Agricultural Extension Service in 1959 indicated about 70 percent of the acreage irrigated in the state was from ground water. Major crops irrigated were cotton, grain sorghum, alfalfa and small grain, and the leading counties in acreage irrigated were Jackson, Texas, Tillman, and Caddo.[5]

The annual reports of the State Board of Agriculture indicated annual fertilizer use in Oklahoma since 1950 has varied from about 107 to 172 thousand tons, but without a significant upward or downward trend. The amount used in 1960 was about 145 thousand tons.

ASC records indicated limestone applied on Oklahoma farmland decreased from about 304 thousand tons in 1951 to about 39 thousand tons in 1957, but then increased to well over 100 thousand tons annually in 1958 and 1959. These tonnages apply to usage by farmers in the state through the ASC program only.

Land Use

Most of the land use trends in the state, starting about 1930, have continued since 1954. An exception was wheat, which increased in acreage from 1930-52, but decreased thereafter through the influence of acreage allotments.

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[4] For comparability, the number of farms in 1959 by the 1954 definition was used in the above computations.

[5] 1959 Irrigation Survey Summary, Mimeo.

As compared with the annual average acreages by land uses during 1949-54, the 1959 acreage of cotton was down from more than a million acres to 660 thousand, wheat acreage was down by about a million acres to 5 million, and corn acreage in the state showed a decline from 811 to 294 thousand acres. In this period, there was little change in the acreage devoted to hay crops. However, grain sorghum and small grains other than wheat increased by about 300 thousand acres, and other uses of cropland, including pasture, increased nearly a million acres.

Livestock Numbers

The change in livestock numbers on Oklahoma farms from January 1, 1956, to January 1, 1960, were as follows:

Beef Cattle	2,582,000 to	2,942,000
Dairy Cattle (including dairy heifers)	662,000 to	603,000
Hogs	463,000 to	490,000
Sheep and Lambs	264,000 to	253,000

Thus, the strong post-war trends of increase in beef cattle and decline in dairy cattle numbers continued in the latter 1950's. Although dairy cows and heifers declined by nearly 60 thousand head in the four-year period, milk production in the state remained about the same due to increased production per cow. The change in numbers of hogs and sheep in the period was insufficient to warrant conclusive statements about trends in these kinds of livestock on Oklahoma farms.

Elements of Conservation Economics

Clark Edwards and James S. Plaxico

Americans are concerned with conservation of our soil resources as a means to certain ends. What are these ends? Society, of course, needs the soil resource for long-term survival. Survival of the human race is most important among the long-range goals of mankind. But we are interested in more than mere survival—we value progress and an improved standard of living as well. To this end, our soil resource must be maintained at a sufficiently productive level capable of producing a bountiful harvest when combined with only a small proportion of our labor force. This frees others to produce houses, clothes, automobiles, appliances, and numerous services which help to make all our lives more comfortable.

Present and Future

We must invest in conservation because depletion of our land could be sufficient to assure failure in the attainment of society's goals. Today's problem is not whether to conserve, but how much to conserve. "How much of today's goods and services must we spend to maintain a productive soil resource as a means of providing a better standard of living for an increasing population?" We are able, of course, to pay a high price for survival. On the other hand, we don't want to spend more than is reasonably necessary.

If the attainment of our long-run goals were the only use for soil resources, the task of soil conservation would be a simple one. However, the task is complicated by conflicting demands on our soil. These demands are made by the farmers and ranchers who, through the privileges of private property ownership, have the right to use the soil to satisfy individual, private, short-run ends. The immediate end of a farmer or

rancher is, of course, to provide as good a life as he is able for his own family. His own interests are usually not projected over time beyond the day he expects to hand his land holdings over to the next generation. All too many fail to plan even that far ahead.

The short-run profit maximizing goal of the farmer and rancher, and the long-run standard of living goal of society, are not necessarily consistent with one another. They are in conflict when one goal is maximized at the expense of the other. For example, we are all aware of the existence of hundreds of washed out, abandoned acres which have been lost from production as a consequence of overcropping and overgrazing by ranchers seeking to increase short-run profits. On the other hand, we are also aware of undergrazed lands which are capable of producing increased output without soil depletion if the land is properly managed. The former illustrates maximizing short-run goals while forsaking the future. The latter illustrates spending more in the form of foregone opportunities to save the soil than the soil is presently worth.

Our conservation task ahead is not that of maximizing short-run profits at the expense of the future food producing capacity of our soil. Nor is it to maximize the future productivity of the soil at the expense of the present generation. The job is rather to use our land so that it will serve the immediate needs of individuals as well as the future needs of society. To determine the optimal degree of soil conservation we must first attain a reasonable comprise between the needs of future generations and the desires of the present generation and then find the best means of meeting these combined needs and desires.

Our ability to define the best level of conservation is limited by (1) our imperfect knowledge of the factual relationships involved, and (2) our difficulty in stating the criterion of best in a manner which is agreeable to all parties concerned. For example, when we speak of a safe, minimum level of conservation, problems of fact are involved in defining what we mean by minimum while problems of value are involved in what we mean by safe. Similarly, conflicts in our beliefs about both facts and values are encountered when a compromise is sought among long and short run, public and private objectives through the political process.

The Role of the Individual

While the long run benefits of soil conservation generally accrue to society, the immediate responsibility for conservation decisions rests

with the individual land owner. He decides finally how much shall be invested in conservation on his farm and what conservation practices shall be used. Thus, soil conservation becomes an individual farm management problem. While all farmers are likely to practice conservation to some degree, they are not likely to practice it to the same degree. Choosing the economic conservation level for an individual farm is an individual problem and there are several reasons why the best level for one farm is not the best level for another. Among these reasons are:

(1) The capital position or net worth of the individual,

(2) The individual's planning horizon and faith in the future,

(3) Leasing arrangements and provisions,

(4) The value of the soil in production.

Capital Position

Funds available for investment are limited on most farms and ranches. Limitations arise from lending policies of credit agencies, abilities of borrowers to repay loans, production and price risks as gauged by both lenders and borrowers, opportunities for off-farm investment, and the effect of family preferences on the allocation of income between production and consumption.

When capital funds are limited, expenditures must be allocated among alternative farm operations such that (1) additional expenditures in each operation are expected to return more than they cost, and (2) additional expenditures in one operation are expected to return at the same rate as expenditures in another operation.

This means that investments in conservation must return more than they cost, and must return at least as much as the same expenditure would be worth if invested elsewhere on the farm such as in livestock or machinery.

Almost all conservation practices require some investment of capital and labor. Some require more than others as, for example, a good drainage system is more demanding on capital and labor than contour plowing. Also, different conservation practices return at different rates. Consequently, we can expect farmers and ranchers in weak capital positions to confine themselves to practices which (1) require small investments, (2) pay high returns per dollar invested, and (3) involve short waiting periods. On the other hand, farmers and ranchers with relatively more capital available may find it possible and profitable to

commit themselves to heavier investments in conservation and adopt practices which have relatively low rates of return or relatively long waiting periods.

A restricted capital position may induce a rancher to expand the size of his business through improved pasture rather than through increased land holdings. For example, it takes an additional net investment of about 10 or 15 dollars to establish Bermuda grass in native pasture land. (Net of ACP payments and income tax deductions.) Thus, ranchers may double the carrying capacity of the land for a considerably smaller investment through improved pasture than through acquisition of additional land. However, the smaller investment in land and improvements is counteracted by an increased requirement per acre for water and an increased expenditure per year for fertilizing and maintaining the Bermuda grass.

The Planning Horizon and the Discount Rate

Planning horizons vary among individuals. Whether a rancher demands that his investment in conservation must be recovered in five or ten years or whether he is willing to regard it as an investment for an indefinite number of years has considerable influence on the best level of conservation for him.

Among the reasons that some farmers and ranchers use short planning horizons are: risk from changes in price or in technology; low market value relative to cost of investment; limited capital; conflicts in production and consumption demands on capital; age of operator; and tenacy.

Uncertainty about future prices induces one to recover enough of his investment capital in a sufficiently short time so that he can be certain that the market value of his investment will be greater than the unrecovered portion. Similarly, one hesitates to make long-run investments in production processes which may be rendered obsolete, and therefore of little value, through advancement in technology.

If the additional market value of a resource is less than the cost of additional investment, then a short planning period is apt to be used to recover the excess of additional investment over market value from the annual flow of earnings. For example, if one is planning to invest $25.00 per acre in establishing Bermuda on native grassland that is worth $60.00 per acre, and does not expect the improved land to have a market value in excess of $65.00 per acre, then he will want to

recover the additional $20.00 as rapidly as possible. He may expect to recover $10.00 through ACP payments and the balance from earnings at the rate of one dollar per year for ten years. If his planning horizon is ten years and he cannot recover at least one dollar per year, then he will not be willing to invest in improved pasture. If his planning horizon is five years, he will need an expected annual return of at least two dollars to interest him in the investment.

Limited capital is associated with short planning periods. When one has only a small stake of capital funds he is interested in investments which have a rapid turnover of capital and he avoids investments of low liquidity. When funds are borrowed for conservation improvements, the planning horizon is frequently determined by the repayment schedule for the borrowed funds.

Family demands on capital frequently affect the business planning period of ranchers. For example, if a rancher desires to have $3000 available to send his son through college seven years from now, then he will not invest that $3000 in his ranch unless he has the expectation of recovering it from annual earnings within the seven year period.

Finally, the length of the planning period is affected by the tenure of the operator. A tenant with a one year lease uses a shorter period than a young owner-operator who has the prospect of devoting the next forty or fifty years of his life to operating the farm.

Associated with the length of the planning period is the individual's faith in the future as reflected in the extent to which he discounts a dollar to be earned in the future relative to a dollar on hand today. Among the reasons that some farmers and ranchers use relatively high discount rates are: production risks, opportunity costs; and limited income relative to family demand for consumption.

Production risks involve variation in the annual quantity of output from a given set of resources as a consequence of, for example, variation in weather. Thus, a rancher who discounts expected future income at a rate of ten percent per year in a climate of uncertain weather conditions might be willing to discount at a rate of only five percent if he lived in a climate of reliable weather with stable rate of production.

Opportunity costs are the costs of foregoing alternative opportunities for investment in order to take advantage of a given opportunity. For example, a rancher considering the prospect of investing funds in establishing Bermuda grass may also have the opportunity of investing in additional native grassland for a return of six percent. In this event

he will not invest in Bermuda unless his additional return is at least six cents on the dollar.

Limited annual income imposes a non-business opportunity cost on potential investment funds. That is, a rancher or farmer with low earnings may use a high discount rate to reflect the fact that some funds are worth more in consumption than in production. Sometimes the intention to invest in terraces does not lose out to the purchase of new machinery but rather to remodeling the kitchen.

To illustrate the effect of the choice of planning period and discount rate on the optimal level of conservation for a given farm, the accompanying tables can be used to compare added investments in conservation to added annual returns. Table 1 shows the present value of a flow of income of one dollar per year. If the rancher uses a 10-year planning period and a 15 percent discount rate, he can invest as much as five dollars to get a return of one dollar per year. If an investment is expected to return three dollars per acre per year then he can invest fifteen dollars per acre. Another rancher, using a twenty-year planning period but the same discount rate would be willing to invest nearly nineteen dollars per acre to get the same return of three dollars per acre per year.

Table 1.—Present Value of a Flow of Income of One Dollar Per Year

Rate	Planning Horizon				
	5 years	10 years	15 years	20 years	Forever
5 percent	$4.33*	$7.72	$10.38	$12.46	$20.00
10 percent	3.79	6.14	7.61	8.52	10.00
15 percent	3.53	5.02	5.85	6.26	6.67
20 percent	2.99	4.19	4.68	4.87	5.00
25 percent	2.69	3.57	3.86	3.96	4.00

* This present value may be interpreted as follows: As much as $4.33 may be invested to acquire a flow of income of one dollar per year for the next five years when a return of five percent is required on the investment.

Table 2, which shows the flow of income that has a present value of one dollar, states the same thing in a different way. It says, for example, the first rancher in the above illustration expects twenty cents return per year on each dollar invested while the second rancher is willing to accept only sixteen cents on the dollar. The greater the discount rate and the shorter the planning horizon, the less a rancher is willing to invest to get a given flow of increased annual revenue.

Table 2.—Flow of Income That Has a Present Value of One Dollar

Rate	Planning Horizon 5 years	10 years	15 years	20 years	Forever
5 percent	$.23*	$.13	$.10	$.08	$.05
10 percent	.26	.16	.13	.12	.10
15 percent	.29	.20	.17	.16	.15
20 percent	.33	.24	.21	.21	.20
25 percent	.37	.28	.26	.25	.25

* This income flow may be interpreted as follows: At least $.23 must be returned per dollar invested for each of the next five years when a return of five percent is required on the investment.

Leasing Arrangements

Typical leasing arrangements frequently result in exploitive systems of farming. Farmer interest in conservation tends to be directly related to the number of years of expected control of the land. Thus, on many farms where there is insecurity of tenure there is usually a conflict in views and a level of conservation results which is not consistent with the real needs of society, the owner, or the operator.

Frequently, the same factors that result in low levels of conservation on rented farms also result in inefficient, unprofitable farming practices. Correcting these deficiencies could help the present generation as well as future generations. Needed revisions in farm leases to provide a basis for a socially desirable level of conservation on rented farms include:

(1) Assurance that both tenants and landlords earn the returns which accrue from their investment in conservation.

(2) Provision to reimburse tenants for unexhausted improvements if tenant-landlord relationships should be terminated.

Value of Soil in Production

Finally, the level of conservation on an individual farm depends on the value to the individual of the land in production. This value is partly determined by the value of the products of the land and partly by the prices and quantities of other resources combined with the land in the productive process. Thus, the best level of conservation on an individual farm depends on the whole farm organization and on the consequent earning capacity of the farm unit.

When a rancher goes from native grass pasture to Bermuda grass, he may be able to take better care of his soil, but to do so he must make several changes in his farm organization. For example, in addition to his initial investment and annual maintenance cost on the Bermuda, he must also use as much as fifty dollars per acre per year of additional livestock capital in order to profitably utilize the improved pasture. When the additional net revenue is distributed among land, labor, and livestock expenses, the additional share for the land alone may not justify the additional land expense even though the rancher is realizing a reasonable average rate of return on all his investment and expenses.

Sometimes it is not the initial investment but the maintenance expense that makes a change unprofitable. For example, some farms in the South Central United States have doubled their carrying capacity through improved pastures. Maintenance of these pastures requires a fertilizer expense in excess of fifteen dollars per acre per year. An Oklahoma ranch carrying a maintenance expense of this magnitude could be placed in a critical financial position in a single drought year. Perhaps this is why some ranchers in northeastern Oklahoma have failed to maintain their improved pasture and returned to native grasses. Evidently the expected maintenance expense of five or six dollars per year in northeast Oklahoma costs more than the additional productivity is worth to these ranchers.

Rising beef prices in future years could increase the value of the land sufficiently that the maintenance of improved pasture can be justified even when averaged over drought years. As land becomes more valuable in production, or as it becomes scarce relative to other productive resources, the level of conservation which the land can sustain is increased.

The Management Function

We have seen that the best level of conservation for any given tract of land depends on (1) an attempt to compromise the long-run needs of society and the short-run desires of the land owner, and on (2) an attempt to optimize the expenditures for conservation relative to other expenditures associated with the land. Thus, conservation is a farm and ranch management problem and we must view conservation decisions within the overall framework of farm resource organization. As a farm or ranch manager considers a soil conservation problem on his land, he has five steps to follow in the resolution of his problem. Professional

agricultural workers can advise and help him with some of the steps—the others he must take alone. The five steps in the resolution of management problem are: (1) observe, (2) analyze, (3) make a decision, (4) take action, and (5) bear responsibility.

The primary task of professional agricultural workers in helping farmers and ranchers with soil conservation problems is to assist in the observational and analysis stages. They must learn the factual relationships related to costs and benefits of conservation and show the individual landowner how these facts affect the operation of his business. Once he decides to adopt a set of conservation practices the professional worker can help him to put his plan into action. However, it is the individual of our society who bears responsibility for the action and it is in his hands that the final decision rests.

Conclusion

Conservation means to give up some immediate use of resources in order to gain a greater total use over time. Whether a conservation practice pays for an individual farmer depends on whether sufficient returns come to him in a reasonable time to cover his costs.

Some conservation practices can be shown to pay on an individual farm. When they do, the farmer receiving the benefits should be willing to bear the costs. Other practices do not pay in the short run to the individual. In these cases, the short-run private policies of farmers come in conflict with long-run public policies and the farmer should not be asked to spend more on a practice than it is worth to him. Society, who reaps some of the rewards, must share some of the cost.

Table 1.—Monthly and Season Average[1] Prices Received by Farmers for Oklahoma Farm Products. (Dollars)

	Wheat	Corn	Oats	Barley	Rye	Grain Sorghum	All hay	Alfalfa hay	Wild hay	Cotton-lint	Cotton-seed	Soy-beans	Pea-nuts
1958	1.75	1.10	.59	.81	.90	1.66	15.50	18.69	12.97	.314	41.40	1.89	.105
1959**	1.75	1.09	.63	.75	.90	1.55	17.00	23.47	14.37	.289	37.70	1.85	.096
1960 Feb.	1.87	1.13	.72	.83	1.00	1.58	21.30	27.00	16.30	.265	38 00	1.83	.090
Mar	1.92	1.13	.72	.83	.99	1.59	24.90	31.00	19.00	.267	38.00	1.83	.090
Apr.	1.91	1.18	.70	.82	.98	1.61	23.50	28.80	18.60	.250	-- --	1.90	.090
May	1.81	1.16	.69	.78	.97	1.58	19.20	22.40	16.00	.284	-- --	1.86	---
June	1.68	1.18	.62	.72	.89	1.56	17.60	21.30	14.00	.300	-- --	1.81	---
July	1.69	1.18	.62	.69	.87	1.57	18.20	22.10	14.60	---	-- --	1.83	---
Aug.	1.72	1.19	.65	.72	.88	1.49	18.60	23.00	14.60	---	-- --	1.82	---
Sep.	1.78	1.05	.65	.73	.95	1.40	19.40	23.80	15.50	.311	40.00	1.80	.098
Oct.	1.78	1.03	.65	.73	.95	1.38	19.90	24.00	16.30	.296	40.00	1.79	.100
Nov.	1.79	1.04	.65	.74	.91	1.38	20.60	25.30	16.50	.279	41.00	1.82	.100
Dec.	1.80	1.06	.66	.75	.89	1.40	21.10	26.00	16.50	.267	42.00	1.83	.095
1961 Jan.	1.83	1.10	.67	.77	.91	1.44	21.60	26 50	17.00	.261	42.00	1.95	.098
Feb.	1.87	1.11	.66	.79	.90	1.51	21.70	27.00	17.00	.233	43.00	2.19	.096

	Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butter-fat	All chickens	Commercial broilers	Eggs	Turkeys	Wool	Alfalfa seed	Sweet Potatoes
1958	21.50	25.50	7.80	21.00	19.60	4.65	.52	.164	.179	.328	.222	.28	19.00	2.35
1959**	22.20	26.90	7.00	19.20	14.20	4.58	.53	.132	.151	.272	.234	.34	21.00	2.30
1960 Feb.	19.70	24.00	7.50	17.50	12.30	4.80	.53	.145	.155	.261	.240	.32*	19.80	2.50
Mar.	20.80	24.40	8.00	19.50	14.00	4.85	.53	.157	.165	.270	.240	.34	20.30	2.50
Apr.	20.60	24.90	7.50	20.00	14.60	4.35*	.53	.140	.165	.281	.230	.38	20.30	---
May	20.40	24.50	7.00	20.70	14.60	4.10	.53	.142	.165	.276	.240	.38	20.50	---
June	19.80	23.50	6.50	21.00	15.30	4.25	.53	.142	.160	.267	.220	.38	-- --	---
July	19.00	22.50	6.50	18.50	16.00	4.30	.53	.151	.170	.256	.220	.38	-- --	---
Aug.	17.70	20.90	6.50	16.70	16.30	4.35*	.53	.136	.160	.282	.220	.36	22.60	2.75
Sep.	17.30	20.50	6.40	16.30	15.40	4.55	.54	.134	.160	.327	.230	.36	23.50	2.35
Oct.	17.00	20.50	6.40	16.30	16.40	4.75	.55	.140	.159	.394	.240	.34	23.60	2.55
Nov.	17.50	21.50	6.20	16.30	16.30	4.85*	.55	.132	.160	.433	.25	.34	23.50	2.60
Dec.	18.40	23.00	6.30	15.80	16.20	5.00	.54	.135	.160	.460	.26	.33	22.50	2.50
1961 Jan.	18.90	23.30	7.00	16.00	16.30	5.00	.54	.143	.160	.395	.23	.33	22.50	2.65
Feb.	19.80	23.50	7.00	16.20	16.80	5.00**	.54	.153	.165	.360	.22	.33	23.50	2.80

SOURCE: *Prices Received by Farmers*, Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, Monthly Releases or *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C.

[1] Annual prices for crops are season average prices for the crop year weighted by marketings. Annual prices for livestock and products are season average prices for the calendar year weighted by marketings.

* Revised ** Preliminary

Table 2.—Index Numbers of Prices Received by Farmers for Oklahoma Farm Products.[1]

(Percent of 1910-14 Average)

		Wheat	Corn	Oats	Barley	Rye	Grain sorghums	All Hay	Cotton-lint	Cotton-seed	Sweet Potatoes
1958		215	180	135	128	109	143	183	228	247	229***
1959		208	175	143	136	109	142	192	248	207	200***
1960	Feb.	217	174	161	139	116	131	241	234	194	203
	Mar.	223	174	161	139	115	132	282	236	194	203
	Apr.	222	182	157	137	114	134	266	221	194	---
	May	210	178	154	130	113	131	218	251	194	---
	June	195	182	139	120	103	130	200	265	194	---
	July	196	182	139	115	101	131	206	265	194	---
	Aug.	200	183	145	120	102	124	211	265	194	223
	Sep.	206	162	145	122	110	116	220	275	204	191
	Oct.	206	158	145	122	110	115	226	261	204	207
	Nov.	208	160	145	124	106	115	234	246	210	211
	Dec.	209	163	148	125	103	116	239	236	215	203
1961	Jan.	212	169	150	129	106	120	245	235	215	215
	Feb.	217	171	148	132	105	126	246	206	220	227

		Cattle	Calves	Sheep	Lambs	Hogs	Wholesale milk	Butterfat	All chickens	Eggs	Wool
1958		445	423	169	358	281	242	223	176	185	180
1959		460	458	150	322	203	238	226	142	155	191
1960	Feb.	408	402	162	301	175	249	226	154	147	198
	Mar.	431	409	173	336	199	252	226	167	152	198
	Apr.	427	417	162	344	207	226*	226	149	158	221
	May	422	410	152	356	207	213	226	151	155	221
	June	410	394	141	361	217	221	226	151	150	221
	July	393	377	141	318	227	223	226	161	144	221
	Aug.	366	350	141	287	232	226*	226	145	158	210
	Sep.	358	343	139	281	219	236	231	143	184	210
	Oct.	352	343	139	281	233	247	235	149	221	198
	Nov.	362	360	134	281	232	252*	235	141	243	198
	Dec.	381	385	136	272	230	260	231	144	258	192
1961	Jan.	391	390	152	275	232	260	231	152	222	192
	Feb.	410	394	152	275	239	260	231	163	202	192

SOURCE: Annual data are averages of months for calendar years and are compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] For the index of purchasing power of a unit of an individual commodity in terms of commodities used in farm production and family living, interest, taxes and wage rates, divide the index of price received by Oklahoma farmers (in this table) by the index prices paid by United States farmers in Table 4 for the same month and multiply by 100.

* Revised ** Data not available *** 9 months average

Table 3.—Price Indexes of Groups of Oklahoma Farm Products.
(Percent of 1910-14 Average)

		All farm products	All crops	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. Prod.	Meat animals	Dairy products	Poultry and poultry prod.
1958		**271**	**220**	**159**	**172**	**230**	**283**	**327**	**401**	**256**	**187**
1959		**267**	**219**	**158**	**174**	**243**	**262**	**320**	**400**	**254**	**157**
1960	Feb.	256	222	159	193	229	238	293	353	261	153
	Mar.	**265**	**228**	**159**	**207**	**230**	**238**	**306**	**373**	**263**	**160**
	Apr.	262	224	162	203	217	238	303*	374	247*	160
	May	259	221	159	184	244	247	300	370	240	159
	June	252	213	156	176	256	238	295	362	245	155
	July	249	214	156	179	256	238	288	351	246	152
	Aug.	246*	216	156	180	256	238	278*	331	247	159
	Sept.	249	223	145	175	266	256	278	322	256	179
	Oct.	252	221	143	176	254	260	285	321	264	209
	Nov.	255	219	144	179	241	262	293*	330	267*	224
	Dec.	260	218	146	183	233	255	305	345	270	237
1961	Jan.	261	221	150	188	232	260	305	352	270	210
	Feb.	262	218	150	190	206	259	310	366	270	197

Purchasing Power Indexes of Groups of Oklahoma Farm Products[1]
(Percent of 1910-14 Average)

		All farm products	All crops	Food grains	Feed grains	Feed grains and hay	Cotton and cottonseed	Oil bearing crops	All livestock & L.S. prod.	Meat animals	Dairy products	Pltry. and pltry. prod.
1958		**92**	**75**	**73**	**54**	**59**	**78**	**96**	**111**	**137**	**87**	**64**
1959		**90**	**74**	**70**	**53**	**59**	**82**	**88**	**107**	**134**	**86**	**53**
1960	Feb.	86	74	73	53	65	77	80	98	118	87	51
	Mar.	**88**	**76**	**74**	**53**	**69**	**77**	**79**	**102**	**124**	**88**	**53**
	Apr.	87	74	74	54	67	72	79	100*	124	82*	53
	May	86	73	70	53	61	81	82	100	123	80	53
	June	84	71	65	52	59	86	80	99	121	82	52
	July	84	72	66	52	60	86	80	97	118	83	51
	Aug.	83	72	67	52	60	86	80	93	111	83	53
	Sept.	84	75	69	49	59	89	86	93	108	86	60
	Oct.	85	74	69	48	59	86	88	96	108	89	70
	Nov.	86	74	70	48	60	81	88	99	111	90*	75
	Dec.	87	73	70	49	61	78	86	102	116	91	80
1961	Jan.	87	73	70	50	62	77	86	101	117	90	70
	Feb.	87	72	72	50	63	68	86	103	121	89	65

SOURCE: Compiled by Dept. of Ag. Econ., Oklahoma State University, from data supplied by Agricultural Marketing Service, U.S.D.A., Oklahoma City, Oklahoma, and Washington, D. C. For previous years, see Oklahoma Agri. Exp. Sta. Publication P-297, Prices Received by Oklahoma Farmers, 1910-1957.

[1] The ratio of prices received by farmers to prices paid by farmers for commodities used in farm living and production, interest, taxes and wage rates. For individual commodities, see footnote 1 of Table 2.

* Revised. ** Preliminary.

Table 4.—Index Numbers in the United States, Index of Demand Deposits in Oklahoma, and Oklahoma Price Ratios.

		United States index numbers of:					Oklahoma price ratios[4]			
		Prices received by farmers (1910-14=100)	Prices paid by farmers (1910-14=100)	Wholesale prices (1910-14=100)	Industrial manufacturing payrolls[1] (1947-49=100)	Index of demand deposits in Oklahoma[2 3] (1923-25=100)	Hog corn	Egg feed	Turkey feed	Milk feed
1955		232	276	249	152.9	291.3	11.4	9.5	7.4	1.622
1956		230	278	256	161.4	297.4	10.4	9.7	7.2	1.695
1957		235	286	264	162.7	290.9	13.6	9.2	6.7	1.757
1958		250	293	268	148.7	313.0	16.9	10.2	6.9	1.968
1959		240	298	268	167.0	334.5	12.6	8.7	6.9	1.877
1960	Feb.	233	299	267	173.9	323.1	10.9	8.2	7.6	1.912
	Mar.	241	300	270	172.6	319.1	12.4	8.5	7.6	1.928
	Apr.	242	302	270	168.8	318.8	12.4	8.8	7.2	1.694
	May	241	301	270	171.5	293.6	12.6	8.8	7.7	1.661
	June	236	299	270	172.5	321.4	13.0	8.7	7.2	1.765
	July	238	298	270	169.2	334.7	13.6	8.4	7.2	1.808
	Aug.	234	298	267	169.2	331.5	13.7	9.2	7.2	1.773
	Sept.	237	298	267	172.5*	327.1	14.7	10.8	7.6	1.948
	Oct.	240	297	270	170 5**	328.1	15.9	13.1	8.0	2.047
	Nov.	241	297	270	169.5	330.9	15.7	14.4	8 3	2.059*
	Dec.	242	298	270	161.9**	354.4	15.3	15.2	8.6	2.095
1961	Jan.	241	301	270	----	354.1	14 8	12.7	7.4	2.024
	Feb.	244	302	270	----	----	15.1	11.7	7.1	2.058**

SOURCE: Indexes of U. S. prices received and prices paid by farmers and indexes of U. S. wholesale prices, from *Agricultural Prices*, A.M.S., U.S.D.A., Washington, D. C. Indexes of demand deposits in Oklahoma, calculated by Dept. Agri. Econ., Okla. Agri. Exp. Sta. from data furnished by Federal Reserve Board, Washington, D. C. Indexes of industrial manufacturing payrolls, from U. S. Department of Labor, Bureau of Labor Statistics, Washington, D. C.

[1] Unadjusted for seasonal variation.

[2] Demand deposits of Oklahoma member banks of the Federal Reserve System located in places under 15,000 population.

[3] Index numbers based on net demand deposits prior to 1936 and upon gross demand deposits since that date. For a discussion of this index see CURRENT FARM ECONOMICS, Oklahoma Agricultural Experiment Station Series 49, Vol. 13, Nos. 1 and 2. Feb.-Apr., 1940. p. 41.

[4] The number of bushels of corn or pounds of feed which one unit of the commodity (100 pounds of hogs, one dozen eggs, one pound of turkeys or milk) will purchase. Prices used are the official A.M.S. estimates of prices received by Oklahoma farmers except for commercial feeds or ingredients which are official A.M.S. estimates of prices paid by Oklahoma farmers. These ratios are computed on the basis of fixed rations and are not directly comparable with ratios computed from other rations. The composition of each ration used is available upon request.

* Revised. ** Preliminary.